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EFFECT, REACTION AND SOME DERMATOLOGIC USES OF THE ACTINIC RAY

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The Actinic Ray manifests four important effects: (1) photochemical, (2) ionic, (3) fluorescent, and (4) biologic. The biologic is of most importance to the clinician as it has both a local activity and general systemic action. The local activity ranges from a slight capillary engorgement to an exudative inflammation; therefore a desired therapeutic result must be determined in each case in order that the local reaction may be carried to that point where maximum benefit will result from treatment. Non-intensive doses applied for a short time yield a maximum of constructive cell activity. Intensive doses applied for a longer time produce stimulative changes in the deeper layers and superficial changes leading to cellular death. The indications for the estimate of the necessary dosage in any given condition are based on the cellular pathology of the part, therefore if the condition is one of a pyogenic organism, then the first dose indicated is for the destruction of the organism and for the repair of the cellular damage that the organism may have excited, namely, a bactericidal effect with cellular stimulation to the point of tissue repair. As for systemic effect, the time and intensity depend upon the reaction sought, as the Actinic Ray produces changes in the quality of the blood, a leukopenia and subsequent leukocytosis. Certain results are due to physiologic chemical changes in the cells at the surface exposed to treatment, and the cellular changes reflect their activity into the venous outflow of blood after taking up the necessary biological element from the arterial supply. There are three types of reaction of therapeutic value to the clinician: (1) stimulative erythema, (2) regenerative erythema, and (3) destructive erythema.

A stimulative erythema results from an exposure that produces a faint blush. It is accompanied by a minimum of cellular protoplasmic change and by a good share of capillary engorgement. It is bactericidal and useful for systemic treatment in the form of general bodily application. Regenerative erythema is a marked hyperemic reaction, carried to the point where it will produce a maximum redness just short of blistering. This possesses the characteristics of stimulation and bactericidal activity incident to the faint blush just discernable, and in addition gives a maximum capillary reaction so as to furnish also a regenerative capacity to the area exposed. Moderate pigmentation follows the regenera-



tive hyperemic exposure. The indications for the regenerative hyperemic reaction include practically all of the dermopathies, associated with inflammation, all the atrophic dermopathies, the parasitic affections of the skin, disorders of the skin glands and all intra-orificial therapy where it is desired to exert a bactericidal effect on an infected mucous membrane surface, including pyogenic invasions of the tonsils, alveodental necrosis, abscesses and other mucosal and intra-mucosal conditions characterized by inflammation. Destructive erythema is a reaction so pronounced as to occasion vesication. It produces in succession, the stimulative blush, then the regenerative hyperemia and goes on further, affecting the protoplasm of the cells, occasioning a marked exudation and resulting ultimately in blister formation, the exudate raising the superficially destroyed cellular layer. The indications for destructive erythema are those skin affections in which hyperplastic and hypertrophic lesions abound. In this type of pathology the destructive superficial action gradually levels the involved area, and at the same time stimulates and regenerates the adjacent parts so as to preclude any spreading of the involvement and any tissue damage carried by continuity. The Actinic bactericidal action is direct and indirect. In the treatment of skin diseases, wherever the invading organism of a skin inflammation rests under the surface, the buried bacteria are affected through the indirect activities of the ray. For each organism and depending upon the site in which the organism is located the action is somewhat different, but it may be generally said that the indirect germicidal activity is affected through changes in the media.

The indirect germicidal effect of Actinic Rays are many times more powerful than the direct effects. Immediately following a general ultra-violet radiation of the entire body, the white cells diminish in number and after some hours begin to increase so that they exceed the original leucocytic count before insulation. There is therefore produced at first a leukopenia and later a leukocytosis. It is also noted that the percentage of mature and immature cells is increased over the percentage of spent cells, therefore the systemic effect of the ray results in the actual production of additional phagocytes. The red blood cells and hemoglobin content are both increased.

The following cases treated by one of us were all taken from a large industrial plant and either cured or so improved that they ultimately were cured, after other forms of treatment had been tried with little or no effect.

Impetigo, four cases, three of which required only a few treatments, the other a case of one year's duration, covering face, chest and back. This case required thirty treatments over a period of three months, with a complete recovery.

Apical, abscess, five cases all selected because of complete drainage along the tooth. These cases were all cured in three to ten treatments, as X-ray examination proved.

Seborrhea, thirty-one cases all improved or cured in three to thirty treatments. Where there was baldness and the hair bulb was not destroyed, a new growth of hair covered the area in six months' time.

Alopecia, eight cases mostly of the premature type; all improved in ten to thirty treatments.

Ununited fracture, four cases, showed no signs of healing in eight weeks' time; were completely united after four to fifteen treatments.

Ethmoid infection, one case following operation, had severe pain only relieved by cocaine; was completely relieved after five treatments.

Tonsilitis (chronic), six cases gave negative cultures after eleven treatments.

Eczema, four cases of the parasitic type were cured in fifteen treatments, and two cases of the erythematous type were cured after thirty treatments.

Infection, three cases were aborted and cured in three treatments.

Pruritus scroti, one case was completely relieved in fifteen treatments.

Furuncle, two cases, one completely aborted, the other terminated in four days with little discomfort and complete healing.

Ringworm (*tinea circinata*), cured in ten treatments.

Psoriasis, localized, two cases treated successfully with fifteen treatments.

Scabies, two cases involving both groins, entirely cleared up with two treatments.

Pompholyx, one case cured in two treatments. No return after one year.

Bone cyst, one case entirely cleared up in seven treatments.

Keloid, one extensive case cured in twenty treatments.

X-ray burn, one case entirely cured in seven treatments.

The above cases were all treated with the Actinic Ray after other well-known remedies had failed; were all purely experimental cases, with no financial obligations on the part of the patient, and were all checked by a specialist in the various lines and X-ray where possible. It must be borne in mind that many of these conditions will reappear, unless proper care as to diet, mode of living, irritating conditions due to certain types of work, irritating dust and the like, are not taken care of. However, as yet I have failed to notice any skin lesion which has not yielded to the Actinic Ray, where the patient has co-operated with me in the treatment. I feel that the Actinic Ray is only another adjunct in therapy and must not be considered a cure-all, but that properly selected cases and a correct working technique will shorten the time of treatment and help to cure obstinate cases that otherwise would continue without relief.



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